



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/910,289 | 07/19/2001 | Jim E. Petranovich | 01CON213P | 1722 |
| 25700 | 7590 | 10/03/2005 | EXAMINER | |
| FARJAMI & FARJAMI LLP 26522 LA ALAMEDA AVENUE, SUITE 360 MISSION VIEJO, CA 92691 | | | TRAN, KHANH C | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2631 | |

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 09/910,289 | Applicant(s) PETRANOVICH, JIM E. | |
| | Examiner Khanh Tran | Art Unit 2631 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-18,20,21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-18,20,21 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/19/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Amendment filed on 06/22/2005 has been entered. Claims 1-6, 8-18, 20-21 and 23 are still pending in this Office action.

Response to Arguments

2. Applicant's arguments, see pages 8-9 under Remarks, filed on 06/22/2005, with respect to the rejection(s) of claim(s) 1, 3-6, 15-18, 20-21 and 23 under 35 U.S.C 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Beale et al. US Patent Application No 2003/0048839 A1. Claims 2, 7 and 19 were indicated allowable, however, upon further consideration, the claimed subject matter in claims 2, 7 and 19 is found to be obvious according to Beale et al. teachings.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 8-11, 15-18, 20-21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beale et al. U.S. 2003/0048839 A1.

Regarding claim 1, in paragraph [0057], Beale et al. teaches that data sequences are made up of a preamble, a header, and a body. The preamble contains training information allowing the receiver to be trained for that data sequence and subsequently to receive and decode the header and body. The header contains baud rate of the data within the body.

In paragraph [0072], also referring to figure 1, the equalizer is initially trained as though the body of the sequence is at a rate of 2 Mbaud. In view of that, the plurality of equalizing taps is adapted for 2 Mbaud.

In paragraph [0073], also referring to figure 1, once the equalizer has been trained by the training sequence, switch 28 is moved to the receive position and the header is decoded 38 to determine the baud rate of the body of the data sequence.

In paragraph [0075], also referring to figure 1, if after decoding the header, it transpires that the equalizer has been trained at the wrong baud rate, then the equalizer must be retrained using thirty two samples in the training sequence store 22. In paragraph [0064], Beale et al. teaches that in embodiments where the higher baud rate (e.g. 4 Mbaud) is twice the lower baud rate (e.g. 2 Mbaud), a zero is inserted after every sample thereby doubling the baud rate of the known training sequence. Furthermore, in paragraph [0071], a sequence ("the 4 Mbaud training sequence") is derived by the upsampler 30 from the known training

sequence. The 4 Mbaud training sequence consists of 32 symbols whereas the 2 Mbaud training sequence consists of 16 symbols. The $2n$ -th 4 Mbaud training sequence symbol is the n -th 2 Mbaud training sequence symbol. The $2n+1$ -th 4 Mbaud training sequence symbol is zero. The 4 Mbaud training sequence approximately aligns with the received sequence.

Beale et al. does not expressly teach "*forcing a zero decision when a zero is inserted into the preamble segment*" as claimed by Applicant.

In paragraph [0075], if after decoding the header, it transpires that the equaliser has been trained at the wrong baud rate (i.e. 2 Mbaud rather than 4 Mbaud) then the equaliser must be retrained using the thirty-two samples in the training sequence store 22. Further, the switch 29 is moved to position 4 allowing the upsampled apriori known training sequence to be fed to the equaliser 24. In paragraph [0076], once the equalizer has been trained, the switch 28 is set to the position wherein the equalizer receives data from the decoding path 18, and the remainder of the header is decoded; see also figure 1. Because the header is always transmitted at the lowest data rate (e.g. 2 Mbaud) of the specification to ensure that it can be received; see paragraph [0057], it would have been obvious for one of ordinary skill in the art at the time of the invention that Beale et al. teachings can be modified to force zero decision when zero is inserted into preamble segment. In paragraph [0076], Beale et al. further teaches that because the header is transmitted at 2 Mbaud every other symbol of the header is a zero, and therefore, every other symbol of the header must be discarded 46.

Art Unit: 2631

In view of that, every other symbol being zero is forced to be zero and is discarded after the equalizer has been retrained.

Regarding claim 2, claim 2 is rejected on the same ground as for claim 1 because of similar scope.

Regarding claims 3 and 20, in paragraph [0076], the header is transmitted at 2 Mbaud rate. Therefore, the symbol rate of the preamble and the symbol rate of the header segment are the same.

Regarding claims 4 and 21, as recited in claim 1, the equalizer is initially trained as though the body of the sequence is at a rate of 2 Mbaud. In paragraph [0075], the header is decoded to indicate 4 Mbaud.

Regarding claim 5, as recited in claim 1, a plurality of zeros is inserted into the preamble to be fed into the equalizer for retraining.

Regarding claim 6, Beale et al. does not expressly teach zero is inserted between each symbol of said header segment. However, in paragraph [0076], the header is transmitted at 2 Mbaud rate. Because the header is transmitted at 2 Mbaud rate, every other symbol of the header is zero, therefore, it would have been obvious for

Art Unit: 2631

one of ordinary skill in the art at the time the invention was made that Beale et al. impliedly teaches zero being inserted between each symbol of said header segment.

Regarding claim 8, claim 8 is rejected on the same ground as for claim 1 because of similar scope. Furthermore, figure 1 illustrate a network adapter including a sampler 14 for extracting and storing the preamble in training sequence store buffer 22, an adaptive equalizer 24, an equalizer state machine, and an upsampler 30 constituting the claimed equalizer.

Regarding claim 9, claim 9 is rejected on the same ground as for claim 4 because of similar scope.

Regarding claim 10, claim 10 is rejected on the same ground as for claim 4 because of similar scope.

Regarding claim 11, in paragraph [0076], once the equaliser has been retrained, the switch 28 is set to the position wherein the equaliser receives data from the decoding path 18, and the remainder of the header is decoded. Because the header is transmitted at 2 Mbaud every other symbol of the header is a zero, and therefore, every other symbol of the header must be discarded 46. In view of that, zero is inserted between each symbol pf the header segment.

Regarding claim 15, referring to figure 1,

In paragraph [0061], the training path 16 includes a training sequence store buffer 22 that stores the training sequence received in the preamble of a data sequence;

Referring to the flow chart of figure 3, at step 52, the preamble is processed;

In paragraph [0073], after the equalizer being trained, the header is decoded to determine the baud rate of the body of the data sequence.

In paragraph [0075], also referring to figure 1, if after decoding the header, it transpires that the equalizer has been trained at the wrong baud rate, then the equalizer must be retrained using thirty two samples in the training sequence store 22. Beale et al. does not expressly teach that a plurality of zeros is inserted into the preamble as set forth in the application claim. Nevertheless, as disclosed in paragraph [0064], Beale et al. teaches that in embodiments where the higher baud rate is twice the lower baud rate a zero is inserted after every sample thereby doubling the baud rate of the apriori known training sequence. Since the preamble contains training information allowing the receiver to be trained for that data sequence, it would have been obvious for of ordinary skill in the art at the time the invention was made that a plurality of zeros is inserted into the preamble to be fed into the equalizer for retraining. Furthermore, Beale et al. does not expressly teach zero is inserted between each symbol of said header segment. However, in paragraph [0076], the header is transmitted at 2 Mbaud rate.

Because the header is transmitted at 2 Mbaud rate, every other symbol of the header is zero, therefore, Beale et al. impliedly teaches zero being inserted between each symbol of said header segment. In paragraph [0076], after the equalizer has been retrained with the preamble of the correct symbol rate, the remaining of the header is decoded.

Beale et al. does not expressly teach "*forcing a zero decision when a zero is inserted into the preamble segment*" as claimed by Applicant.

In paragraph [0075], if after decoding the header, it transpires that the equaliser has been trained at the wrong baud rate (i.e. 2 Mbaud rather than 4 Mbaud) then the equaliser must be retrained using the thirty-two samples in the training sequence store 22. Further, the switch 29 is moved to position 4 allowing the upsampled apriori known training sequence to be fed to the equaliser 24. In paragraph [0076], once the equalizer has been trained, the switch 28 is set to the position wherein the equalizer receives data from the decoding path 18, and the remainder of the header is decoded; see also figure 1. Because the header is always transmitted at the lowest data rate (e.g. 2 Mbaud) of the specification to ensure that it can be received; see paragraph [0057], it would have been obvious for one of ordinary skill in the art at the time of the invention that Beale et al. teachings can be modified to force zero decision when zero is inserted into preamble segment. In paragraph [0076], Beale et al. further teaches that because the header is transmitted at 2 Mbaud every other symbol of the header is a zero, and therefore, every other symbol of the header must be discarded 46.

Art Unit: 2631

In view of that, every other symbol being zero is forced to be zero and is discarded after the equalizer has been retrained.

Regarding claims 16-17, in paragraph [0062], an adaptive equalizer 24 is provided that contains an adaptive filter, which may comprise a FIR filter. The coefficients for the adaptive filter *are trained for each data sequence* that is received and the equalizer state machine diagram controls the data that is fed to the equalizer 24.

Regarding claim 18, referring to figure 1, buffering and processing the preamble are performed concurrently as appreciated by one of ordinary skill in the art.

Regarding claim 23, as recited in claim 15, Beale et al. does not expressly teach that a plurality of zeros is inserted into the preamble as set forth in the application claim. Nevertheless, as disclosed in paragraph [0064], Beale et al. teaches that in embodiments where the higher baud rate is twice the lower baud rate a zero is inserted after every sample thereby doubling the baud rate of the apriori known training sequence. Since the preamble contains training information allowing the receiver to be trained for that data sequence, it would have been obvious for of ordinary skill in the art at the time the invention was made that a plurality of zeros is inserted into the preamble to be fed into the equalizer for retraining. Furthermore, Beale et al. does not expressly teach zero is inserted between each symbol of said header segment. However, in

Art Unit: 2631

paragraph [0076], the header is transmitted at 2 Mbaud rate. Because the header is transmitted at 2 Mbaud rate, every other symbol of the header is zero, therefore, Beale et al. impliedly teaches zero being inserted between each symbol of said header segment. In paragraph [0076], after the equalizer has been retrained with the preamble of the correct symbol rate, the remaining of the header is decoded.

4. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beale et al. U.S. 2003/0048839 A1 as applied to claim 8 above, and further in view of Sommer et al. U.S. Patent 6,240,133 B1.

Regarding claims 12-13, Beale et al. does not teach the equalizer being a decision feedback equalizer as claimed by Applicant.

Sommer et al. invention is directed to an adaptive equalizer capable of tracking rapid channel variations while maintaining high stability and low jitter. Figure 2 illustrates the adaptive equalizer 16 according to Sommer et al. teachings, the equalizer 16 is based on the well-known decision feedback equalizer architecture; see column 8, lines 15-35. Because an adapter filter can be implemented to include a decision feedback equalizer, it would have been obvious for one of ordinary skill in the art at the time of the invention that Beale et al. adaptive equalizer can be modified to implement to include feedforward equalizer sections and decision feedback equalizer sections as taught by Sommer et al. in figure 2. In column 3, lines 20-40, Sommer et al. further teaches that the adaptive equalizer in figure 2 permits fast tracking time varying reflections without sacrificing the stability of the equalizer.

Art Unit: 2631

Regarding claim 14, the adaptive equalizer as shown in figure 2 according to Sommer et al. invention is a linear equalizer.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT

Khanh Cong Tran

09/30/2005

Examiner KHANH TRAN